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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Naoshi Masukawa

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EXAMINER

HARM, NICKOLAS R

ART UNIT

PAPER NUMBER

1791

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DELIVERY MODE

04/27/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/578,576	Applicant(s) MASUKAWA ET AL.	
	Examiner NICKOLAS HARM	Art Unit 4191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Summary

1. Claims 1-4 are present and have been fully considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1, 2, and 4 rejected under 35 U.S.C. 103(a) as being unpatentable over NARUSE et al. (US 5,914,187) in view of PEARSON et al. (US 6,099,671).

a. Claim 1 requires a honeycomb structure comprising a plurality of honeycomb segments, each having a plurality of cells partitioned by porous walls, functioning as fluid channels with outer walls, which are bonded together via a bonding material containing a ceramic as a main component. Claim 1 further requires that the bonded portion have a three-point bending strength of at least 5 MPa and a shearing strength of at least 1 MPa. NARUSE teaches an

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equivalent honeycomb structure comprising an assembly of plural ceramic members, each having a plurality of through-holes functioning as channels which connect a gas inlet and gas outlet, where adjacent outer walls are porous, the ceramic members bound together by a sealing member containing ceramic fiber as a principal component (col. 3, lines 44-61). Because the claimed product and prior art are of substantially identical structure and composition, the claimed properties are inherent in the prior art (MPEP 2112.01). Additionally, claim 1 requires that after being bonded, the plurality of honeycomb segments are heat treated at a temperature between 400 and 1200 degrees Celsius. NARUSE teaches that the segments, once bonded together, are heated at between 50 and 100 degrees Celsius (col. 8, lines 9-11), but does teach heating within the claimed range. However, NARUSE does contemplate heating the honeycomb body to temperatures of approximately 900 degrees Celsius after bonding the segments together (col. 9, lines 2-5), and PEARSON teaches the formation of a bonding layer between ceramic foams, such as the honeycomb segments taught by NARUSE and applicant, through pyrolysis is typically carried out at between 1000 and 2000 degrees Fahrenheit (537.7 and 1093.3 degrees Celsius) (col. 3, lines 49-51). One of ordinary skill in the art would pyrolyze the bonding material of NARUSE at the higher temperature of PEARSON because the higher temperature pyrolysis was known in the art, or because it would be obvious to try heating the bonded honeycomb body at a temperature near temperatures anticipated in actual use.

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b. Claim 2 requires the honeycomb structure recited in claim 1, wherein the bonding material contains inorganic particles, an oxide fiber, and a colloidal oxide. The NARUSE reference teaches a honeycomb structure comprising a plurality of honeycomb structures bound together by a sealing member, the sealing member comprising inorganic particles, inorganic fibers, and an inorganic binder (col. 3, lines 54-56). NARUSE lists as preferred embodiments of the recited inorganic fiber silica-alumina, mullite, alumina, and silica, which are oxides (col. 3, line 67 - col. 4, line 1). NARUSE lists as preferred embodiments of the recited inorganic binder silica colloidal sol and alumina colloidal sol, both of which are colloidal oxides.

c. Claim 4 requires a method of manufacturing a honeycomb structure by bonding together a plurality of honeycomb segments, each segment having a plurality of cells partitioned by porous walls, functioning as fluid channels with outer walls, wherein the honeycomb segments are bonded together by means of a bonding material containing ceramic as a main component. NARUSE teaches a honeycomb structure comprising an assembly of plural ceramic members, each having a plurality of through-holes functioning as channels which connect a gas inlet and gas outlet, where adjacent outer walls are porous, where the ceramic members are bonded together by a sealing member containing ceramic fiber as a principal component (col. 3, lines 44-61). One of ordinary skill in the art would recognize that the porous ceramic bodies bonded together in NARUSE (col. 3, lines 50-54) are ceramic foams. PEARSON teaches a method of bonding

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ceramic foams together by means of a ceramic bonding material (col. 3, lines 32-50). Claim 4 also requires that the bonded structure is subjected to a heat treatment at a temperature of 400 to 1200°C. NARUSE teaches that the segments, once bonded together, are heated at between 50 and 100 degrees Celsius (col. 8, lines 9-11), but does teach heating within the claimed range. However, NARUSE does contemplate heating the honeycomb body to temperatures of approximately 900 degrees Celsius after bonding the segments together (col. 9, lines 2-5), and PEARSON teaches the formation of a bonding layer between ceramic foams, such as the honeycomb segments taught by NARUSE and applicant, through pyrolysis is typically carried out at between 1000 and 2000 degrees Fahrenheit (537.7 and 1093.3 degrees Celsius) (col. 3, lines 49-51). One of ordinary skill in the art would pyrolyze the bonding material of NARUSE at the higher temperature of PEARSON because the higher temperature pyrolysis was known in the art, or because it would be obvious to try heating the bonded honeycomb body at a temperature near temperatures anticipated in actual use. Finally, claim 4 requires that the three-point bending strength of a bonding layer formed of the bonding material is 5 MPa or more, and a shearing strength of a bonding portion including the bonding layer and the outer walls sandwiching this bonding layer therebetween is 1 MPa or more. Because the steps of the method as claimed would be obvious over the prior art as combined, the claimed properties are inherent in the prior art (MPEP 2112.01).

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5. Claim 3 rejected under 35 U.S.C. 103(a) as being unpatentable over NARUSE and PEARSON, and further in view of MUROI et al. (US 2003/0151155 A1).

a. Claim 3 requires the honeycomb structure of claim 1, where the bonding material contains a foamed resin. The NARUSE reference teaches a porous ceramic honeycomb structure, but does not explicitly teach the use of foamed resin in the individual segments, or the desirability in the art of using as a binding material the same material used in the individual segments. MUROI teaches a porous ceramic structure containing ceramic as a main component and a foamed resin as a pore-forming agent (paras. [0011] and [0014]). One of ordinary skill in the art would combine the teaching of MUROI with the teaching of NARUSE because the foamed resin of MUROI is a functionally equivalent alternate way of forming the pores in NARUSE. PEARSON teaches a method of adhering individual ceramic foams to one another by means of a bonding material (col. 1, lines 49-56), as well as the desirability in the art of using as the bonding material the same type of material as used in the individual ceramic foams (col. 1, lines 37-40). One of ordinary skill in the art would combine the teachings of PEARSON with the teachings of MUROI and NARUSE because using the same material as a bonding agent as was used in the formation of the individual honeycomb segments would lead to a product with consistent material properties, and would reduce manufacturing cost associated with production of additional materials. Therefore, one of ordinary skill in the art would be motivated to create a honeycomb structure using a foamed resin as a pore-forming agent in

the ceramic bonding material used to bond together the individual ceramic segments.

Response to Arguments

6. Applicant's arguments filed February 13, 2009 have been fully considered but they are not persuasive.

a. Applicant argues that features such as three point bending strength and shearing strength do not appear in the references cited. However, the claimed properties are inherent in the obvious combination of the prior art references described above.

b. Applicant argues that the solid-reinforced bonding resin described in PEARSON is filled into the whole ceramic foam. However, PEARSON merely describes that the resin is applied to at least one foam, the foams are joined together, and the resin is pyrolyzed to form a ceramic bonding layer (col. 3, lines 32-35 and 44-45).

7. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that the foamed resin of the present application has a different object and function than the foamed resin described in MUROI) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

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8. Applicant's arguments, see page 6, lines 12-15, filed February 13, 2009, with respect to the rejection(s) of claim(s) 4 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of NARUSE and PEARSON, as described above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICKOLAS HARM whose telephone number is (571)270-7605. The examiner can normally be reached on Mon-Thurs, 7:30a-5:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip Tucker can be reached on (571)272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NICKOLAS HARM/
Examiner, Art Unit 4191

/Mark A Osele/
Primary Examiner, Art Unit 1791
April 23, 2009